

WHAT IS CLAIMED IS:

1. A substrate having magnetoresistive elements, comprising a lower shielding layer formed on a substrate, a lower gap layer formed on the lower shielding layer, a plurality of magnetoresistive elements each having a multilayer film exhibiting a magnetoresistive effect, and electrode layers conducting to the multilayer film, and a processing monitor element having the same structure as the magnetoresistive elements, these elements being arranged on the lower gap layer, wherein besides the lower gap layer, an insulating layer is formed between the monitor element and the lower shielding layer to be exposed from the ABS side, and the distance between the monitor element and the lower shielding layer on the ABS side is larger than that between the magnetoresistive elements and the lower shielding layer on the ABS side.

2. A substrate having magnetoresistive elements according to Claim 1, wherein the total thickness of the lower gap layer and the insulating layer is 700 angstroms or more.

3. A substrate having magnetoresistive elements according to Claim 1, wherein the insulating layer is formed

on the lower shielding layer, and the lower gap layer is formed on the insulating layer so that the monitor element is formed on the lower gap layer.

4. A substrate having magnetoresistive elements according to Claim 3, wherein a recessed portion is formed in the surface of the lower shielding layer, and the insulating layer is formed in the recessed portion so that the monitor element is formed on the insulating layer with the lower gap layer formed therebetween.

5. A substrate having magnetoresistive elements according to Claim 4, wherein the surface of the insulating layer formed in the recessed portion of the lower shielding layer and the surface of the lower shielding layer are formed in the same plane.

6. A substrate having magnetoresistive elements according to Claim 3, wherein the insulating layer is superposed on the surface of the lower shielding layer to form a step between the upper side of the insulating layer and the surface of the lower shielding layer so that inclined surfaces are formed on the sides of the insulating layer in the stepped portion.

7. A substrate having magnetoresistive elements according to Claim 1, wherein the insulating layer is made of any one of insulating materials such as SiO_2 , Ta_2O_5 , TiO , Al_2O_3 , Si_3N_4 , AlN , and WO_3 .

8. A substrate having magnetoresistive elements according to Claim 1, wherein the insulating layer is also formed below the electrode layers which respectively constitute the magnetoresistive elements except portions below the multilayer films which respectively constitute the magnetoresistive elements.

9. A substrate having magnetoresistive elements, comprising a lower shielding layer formed on a substrate, a lower gap layer formed on the lower shielding layer, a plurality of magnetoresistive elements each having a multilayer film exhibiting a magnetoresistive effect, and electrode layers conducting to the multilayer film, and a processing monitor element having the same structure as the magnetoresistive elements, these elements being arranged on the lower gap layer, wherein besides an upper gap layer, an insulating layer is formed on the magnetoresistive elements and the monitor element to be exposed from the ABS side, and the distance between the monitor element and an upper shielding layer on the ABS side is larger than that between

Sub A2 [the magnetoresistive elements and the upper shielding layer on the ABS side.

10. A substrate having magnetoresistive elements according to Claim 9, wherein the total thickness of the upper gap layer and the insulating layer is 700 angstroms or more.

11. A substrate having magnetoresistive elements according to Claim 10, wherein the insulating layer is also formed above the electrode layers which respectively constitute the magnetoresistive elements except portions above the multilayer films which respectively constitute the magnetoresistive elements.

12. A substrate having magnetoresistive elements according to Claim 8, wherein the insulating layer superposed on the electrode layers of the magnetoresistive elements is exposed from the ABS side.

[13. A substrate having magnetoresistive elements, comprising a lower shielding layer formed on a substrate, a lower gap layer formed on the lower shielding layer, a plurality of magnetoresistive elements formed on the lower gap layer and each having a multilayer film exhibiting a

43b
43c

magnetoresistive effect, and electrode layers conducting to the multilayer film, and a processing monitor element formed adjacent to the plurality of magnetoresistive elements and having the same structure as the magnetoresistive elements so that on the ABS side, the monitor element is formed on the substrate with the lower gap layer held therebetween, without the lower shielding layer.

14. A substrate having magnetoresistive elements according to Claim 13, wherein an insulating layer is formed between the substrate and the lower gap layer formed below the monitor element.

15. A substrate having magnetoresistive elements according to Claim 14, wherein the surface of the insulating layer and the surface of the lower shielding layer formed on the substrate are formed in the same plane.

16. A substrate having magnetoresistive elements according to Claim 13, wherein an upper shielding layer formed on the magnetoresistive elements with an upper gap layer formed therebetween is not formed on a portion of the upper gap layer which is formed on the monitor element on the ABS side.

17. A substrate having magnetoresistive elements according to Claim 16, wherein a write gap layer of an inductive head is formed on the portion of the upper gap layer which is formed on the monitor element.